

CLAIMS

1. An apparatus for transferring at least one part to be deposited on an immobilised pallet, characterised in that it comprises a transporter (42) equipped with a gripping device (50) and adapted to grasp the part (38) on a distributor (40), displace it and deposit it in a positioning tool (54), and a manipulator (60) equipped with a gripper (62) and adapted to grasp the part in a precise position in the positioning tool (54), displace it and deposit it in a precise position in a positioning receptacle (64) carried by the pallet (12).
2. An apparatus as set forth in claim 1 characterised in that the distributor (40) and the positioning tool (54) are disposed at adjacent vertical levels (N1, N2) while the positioning receptacle (64) carried by the pallet is disposed at a vertical level (N3) below the vertical level (N2) of the positioning tool (54).
3. An apparatus as set forth in one of claims 1 and 2 characterised in that transporter (42) comprises a mechanism (22, 45, 44) involving crossed movements, which is adapted to provide pilot-control of a carriage (46) in two mutually perpendicular horizontal directions (F1, F2), and the carriage (46) carries a vertical actuator (48) which supports the gripping device (50).
4. An apparatus as set forth in one of claims 1 through 3 characterised in that the gripper (50) comprises two movable jaws (52) adapted to be moved towards each other to grasp the part (38) on the distributor (40) and to be moved away from each other to deposit it in the positioning tool (64).
5. An apparatus as set forth in one of claims 1 through 4 characterised in that the manipulator (60) comprises an actuator (66) involving vertical displacement, which carries a support arm (68) adapted

to pivot over a limited angular range of selected value, and the support arm (68) supports the gripper (62) to permit the latter to be displaced by a combined movement of horizontal rotation and vertical translation.

6. Apparatus as set forth in claim 5 characterised in that the manipulator (60) is connected to operational control means for effecting the following sequence of operations: moving the gripper (62) above the positioning tool (54), actuating the gripper (62) to pick up the part (38) in said positioning tool (54), pivoting the support arm (68) over said angular range, displacing the support arm (68) vertically without a change to its angular orientation to move the gripper (62) above the positioning receptacle (64) carried by the pallet, actuating the gripper (62) to deposit the part in said positioning receptacle (64) and moving the gripper again above the positioning tool (54) for a fresh sequence of operations.

7. Apparatus as set forth in one of claims 5 and 6 characterised in that said limited angular range corresponds to 180°.

8. Apparatus as set forth in one of claims 5 through 7 characterised in that the gripper (62) comprises two movable jaws (70) adapted to be moved towards each other to grasp the part (38) in the positioning tool (54) and to be moved away from each other to deposit it in the positioning receptacle (64) carried by the pallet (12).

9. Apparatus as set forth in one of claims 5 through 8 characterised in that it comprises centering means (72, 76, 82) adapted to effect precise mutual positioning of the gripper (62) on the one hand with the positioning tool (54) and on the other hand with the positioning receptacle (64) carried by the pallet.

10. Apparatus as set forth in claim 9 characterised in that the centering means comprise at least two male centering rods (72) carried by the gripper (62) and adapted to engage either into corresponding holes

(76) in the positioning tool (54) or into corresponding holes (82) in the positioning receptacle (64) carried by the pallet.

11. Apparatus as set forth in claim 10 characterised in that the positioning tool (54) is mounted floatingly on a fixed support (56) by way of elastic means (78).

12. Apparatus as set forth in claim 10 characterised in that the positioning receptacle (64) is mounted floatingly on the pallet (12) by way of elastic means (84).

13. Apparatus as set forth in one of claims 11 and 12 characterised in that the elastic means (78, 84) comprise elastic washers or legs.

14. An installation for the circulation of part-carrying pallets characterised in that it comprises a transfer apparatus (14) according to one of claims 1 through 13 arranged to deposit a part (38) on a pallet (12) immobilised at the location of a station (36) of the installation.